

Gill Bridge  
Spanning Lick Creek at County Road 181  
Vicinity of Perry  
Ralls County  
Missouri

HAER No. MO-94

HAER  
MO  
87-PER.V,  
1-

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PHOTOGRAPHS

HISTORICAL AND DESCRIPTIVE DATA

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Historic American Engineering Record  
National Park Service  
Great Plains Systems Office  
Department of the Interior  
1709 Jackson Street  
Omaha, Nebraska 68102-2571

# HISTORIC AMERICAN ENGINEERING RECORD

## GILL BRIDGE

HAER  
MO  
87-PER.V,  
1-

HAER No. MO-94

**Location:** Spanning Lick Creek at County Road 181; 0.6 mile west of Perry; Section 28/33, Township 54 North, Range 7 West; Ralls County, Missouri.

**USGS Quadrangle:** Perry, Missouri (7½ Minute Series)

**Construction Date:** 1909

**Fabricator:** Stupp Brothers Bridge and Iron Company, St. Louis, Missouri

**Builder:** Stupp Brothers Bridge and Iron Company, St. Louis, Missouri

**Present Owner:** Ralls County, Missouri

**Present Use:** One-lane roadway bridge (to be replaced in 1996)

**Significance:** Between the early 1880s, when trusses superseded bow-strings, and the 1920s, when riveted connections replaced pinned, the pin-connected Pratt truss was the metal structure of choice for medium- and long-span wagon bridges in Missouri. Virtually all of the major regional fabricators manufactured Pratt trusses and marketed them extensively to Missouri's counties. As a result, thousands of Pratt trusses were built across the state, and many remain in place today. With a fabrication date of 1909 and a span length of 95 feet, the Gill Bridge is neither the oldest nor the longest of these. Nevertheless, it is important for its illustration of two prevailing bridge trends—the construction of rural roadway bridges by county governments and the design and manufacture of pinned Pratt trusses in the late 19th and early 20th centuries. The Gill Bridge is today distinguished among Missouri's pin-connected trusses as a well-documented and well-preserved example of what was once a mainstay structural type.

**Assembled by:** Clayton B. Fraser  
Fraserdesign  
Loveland Colorado

March 1996

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The Historic American Engineering Record [HAER] documentation for the Gill Bridge was conducted by Fraserdesign of Loveland, Colorado, under contract with Ralls County, Missouri. The county has proposed replacement of the structure in 1996; this documentation is intended to mitigate, in part, the impact on the bridge by this action. Photographic recordation, research and preparation of this report were undertaken in February and March 1996. The research for this project has involved five primary archival sources: the County Clerk's Office at the Ralls County Courthouse in New London, Missouri; the Free Library in Hannibal, Missouri; the Missouri State Library and the Missouri Highway and Transportation Department, both located in Jefferson City, Missouri; and the St. Louis Public Library in St. Louis.

**R**alls County, Missouri, was formed by an act of the state legislature on November 6, 1820. Named after Daniel Ralls, a state legislator who had died earlier that year, the county originally encompassed most of the northeastern corner of the state. It extended north to the Iowa border and east to the Mississippi River and included lands that eventually became Audrain, Monroe, Shelby, Marion, Know, Lewis, Clark and Scotland counties. By the time the last of these was partitioned from Ralls County in 1836, the region had undergone some thirty years of settlement. By the mid-1840s Ralls County was largely homesteaded, with a handful of crossroads villages established as centers of commerce. As towns such as New London, Saverton, Hazard and Rensselaer developed, an impromptu network of roads and trails formed to link them, following the typical pattern of settlement and transportation.<sup>1</sup>

The first planned road in the county was reportedly the route that Marturin Bouvet built from his salt works on Lick Creek to the Bay de Charles on the Mississippi River. Another road was later cleared to link New London, the Ralls County seat, with Hannibal. In 1823 the Salt River Road was extended from St. Charles through Ralls County to the mouth of the Des Moines River at Missouri's northeastern tip. Other local trails and post roads developed over time to link settlers with the mills and towns. Most were surfaced with hard-packed earth and often became seething quagmires after heavy rains, but two of the county's early roads were covered with timber planks. The more famous of these latter tracks was the Hannibal and New London Plank Road, a toll route that linked the interior with a port on the Mississippi River. Agitation for this road began in 1852; that year a contingent from Hannibal approached the Ralls County Court with a proposal to build the road if the county would construct a bridge over the Salt River along its route. With the county's approval for the bridge, the road was laid using oak planks set on a tamped earth base.<sup>2</sup>

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Plagued by severe maintenance costs, the plank road lasted only a short time. It was eventually sold at a substantial loss to the Hannibal and Ralls County Gravel Road Company, which removed the timbers and resurfaced the route with stone. The Salt River Bridge-Ralls County's first major wagon span-fared somewhat better than the road, although it too required frequent repairs to keep it serviceable. In this it was indicative of early bridge construction in the county. As the region developed, road maintenance and bridge construction fell under the aegis of the county court. To span the myriad of streams, runs, gullies, sloughs and washes that crisscrossed the region, the judges ordered small-scale timber stringer structures built in the mid-19th century. Though inexpensive to erect, most of these spans tended to be structurally suspect and required constant maintenance to prevent their collapse. Moreover, they were limited to short-span applications. Timber/iron combination trusses, covered with wood walls and roofs, were used for crossings that required longer spans. And in the late 1870s the county court began contracting for all-iron structures as a more durable alternative to wood construction.<sup>3</sup>

At the turn of the century some 825 miles of public road extended through Ralls County. Of these 35 miles were surfaced with gravel or stone. Most of the better roads were old turnpikes, all but the New London-Hannibal Gravel Road by then freed of tolls.<sup>4</sup> After 1900 the county court continued its modest program of road and bridge construction, typically building one or two steel trusses per year. The judges at this time contracted for such major structures as the Joanna Bridge over the Salt River (1900) and the Menafee Ford Bridge over Lick Creek (1901), as well as shorter spans over Spencer, Ely and Bear creeks. In 1905 the pace quickened somewhat, as the county began erecting short-span trusses in groups. Though the structures were strictly utilitarian, they were also a symbol of accomplishment, at least for County Surveyor George H. Engle, who began using a lithograph of the Ashers Ford Bridge over the Salt River on his office letterhead.<sup>5</sup>

**T**o fabricate and erect these steel structures, the county relied exclusively on a single bridge manufacturer-the Stupp Brothers Bridge and Iron Company. In this, Ralls County was simply following a regional trend. As Ralls and other counties in Missouri, Iowa and Illinois contracted with the St. Louis-based bridge firm in the late 19th century, Stupp Brothers emerged as one of the region's most prolific bridge builders. The company had been founded in 1859 as the South St. Louis Iron Works by John Stupp, a German immigrant who had moved to St. Louis from New York. After John Stupp retired in 1879, his three sons, George, Peter and Julius, operated the firm, manufacturing architectural and structural iron, boilers and machinery in their shop on Carondelet Avenue. "They build

iron and steel bridges for railways, cities and country highways on contract," an 1898 gazette stated, "or they furnish other contractors the ready made parts, manufacture Wrought Iron and Steel Work for buildings and other articles therewith connected."<sup>6</sup>

The counties and municipalities of Missouri were among the Stupp brothers' best customers. The period of extensive rural road and bridge construction in the state during the late 19th century coincided with the Stupps' ascendance in the industry, combining to create a booming market for the firm's regional sales representatives. The Stupps operated branch offices in Kansas City and Iowa City, from which they solicited contracts, submitted bids and built bridges. In 1886 the company moved its plant to larger quarters at Seventh and Shenandoah streets. There between 80 and 90 men fabricated bridges at works that "cover nearly an entire block and are equipped with the most complete machinery and all facilities for factory purposes." In 1890 the brothers incorporated the firm as the Stupp Brothers Bridge and Iron Company. In 1904 the Stupps exhibited a display on bridge construction at the St. Louis World's Fair.<sup>7</sup>

**R**alls County was a steady if unspectacular client of Stupp Brothers Bridge and Iron. The competitive bidding process that the county employed in the 19th century was largely dropped after 1904, as George Engle simply ordered new steel structures from Stupp, based upon the bridge company's plans and specifications. To gauge the necessity for bridges at particular crossings, Engle and the court usually relied on citizens' petitions to the court. These were often accompanied by subscriptions of money to help the county defray the cost of construction. In September 1903, for instance, the court received a "numerously signed" petition and subscription for a steel truss over Taylor's Branch north of Perry. The court responded by directing Engle to "view, survey and estimate the cost" for the bridge. A month later he hired a local contractor to build the abutments. When the abutments were completed, Engle ordered a truss from Stupp; by March 1904 the Taylor's Branch Bridge was complete.<sup>8</sup>

In August 1905 the court received a similar petition for a steel bridge to replace the aging timber span over Lick Creek on the road between Perry, in Ralls County, and Santa Fe, in Monroe County. M.P. LaFrance and several other residents of Salt River Township were joined by a contingent from Monroe County in requesting the new structure. "We the undersigned, resident citizens of Ralls and Monroe Counties," their application stated, "receiving our Mail, transacting our business, Banking, Merchandise of all kinds, and shipping there from produce, live stock and etc. from Perry; respectively ask your favorable consideration of

a Petition now before your Honorable Body, to build a wagon bridge accross [sic] Lick Creek on the road leading West from Perry to Santa Fe, Missouri." Although many people signed the petition, they did not offer an accompanying subscription of money and could not, therefore, present a persuasive case to the court. The judges tabled their petition indefinitely. It was not until M.T. Gill was elected to the county court three years later that the prospects for a replacement bridge over Lick Creek began to improve.<sup>9</sup>

Judge May Tompkins Gill was born in 1865 on a farm alongside Lick Creek five miles south of Perry. His father, Thomas Gill, was an accomplished merchant farmer who had moved to Missouri from Illinois in 1852. In 1866 Thomas Gill bought a store and relocated the family to the Lick Creek Crossroads, which later developed into the town of Perry. Here he operated the store, as well as a mill, a livery stable and a lumber yard, eventually acquiring two-thirds of the real estate in town. May Gill worked for his father at these businesses before moving out on his own. He married Lena Moss in 1892 and obtained property from his father immediately west of Perry, on which he established a thriving commercial stock farm. "He is widely known among the extensive stockmen and the mule buyers have learned to depend upon his ranch for valuable animals by the carload," one gazetteer stated. In 1899 Gill built a substantial frame house on his farm.<sup>10</sup> "The Gill residence is among the elaborate country homes of Ralls County," the gazetteer continued. "It commands a view of the big farm-ranch, and reflects the substantial character of its owner. Its wooded front echoes the noise of the little commercial center just beyond Lick Creek and its annual output adds materially to the clearings credited to Perry as a business point."<sup>11</sup>

As a vice president of the Perry Bank and one of the small town's chief capitalists, May Gill eventually dominated Perry commerce as his father had. His move into local politics thus seemed a natural extension of his business dealings. In 1908 Gill was elected one of the three judges on the Ralls County Court. There he served for four years as western district judge and for four more years as presiding judge.<sup>12</sup>

After Gill's election in 1908, he, along with judges H.J. Priest and J.H. Holloway, almost immediately undertook an ambitious program of bridge construction. "Their administration has been marked with the improvements to the highways, the building of bridges and other noteworthy accomplishments," a county history reported in 1912.<sup>13</sup> The judges authorized bridges throughout the county, but concentrated much of the new construction in Salt River Township. In late 1908 and 1909 the court ordered at least six new steel bridges built on the roads in

the southwestern section of the county. One of these was to span Lick Creek just west of Perry—the crossing that had been petitioned unsuccessfully in 1905. By 1909 the court's receptivity to the bridge had changed appreciably, due largely to the fact that it was located adjacent to Gill's farm [see *Figure 1*]. With Gill benefitting directly from the new span, its acceptance by the court was assured, a fact acknowledged by the judges when they referred to the structure as the Gill Bridge.<sup>14</sup>

At the court's direction in the spring of 1909, county surveyor A. Victor Ely ordered a 95-foot truss for the Gill Bridge, to be fabricated and erected by Stupp Brothers.

Like his predecessor, George Engle, Ely simply outlined the overall dimensions for the Lick Creek Bridge and left the specific truss design to the bridge company. As delineated by Stupp, the structure consisted of a pin-connected Pratt through truss over the creek's main channel, flanked on both sides by steel stringer approach spans.

Typical of most of the region's bridge builders, the Stupp Brothers relied heavily on pin-connected Pratt truss variants for its standard truss types. Patented in 1844 by Thomas and Caleb Pratt, the Pratt design was characterized by upper chords and vertical members acting in compression and lower chords and diagonals that functioned in tension. Its parallel chords and equal panel

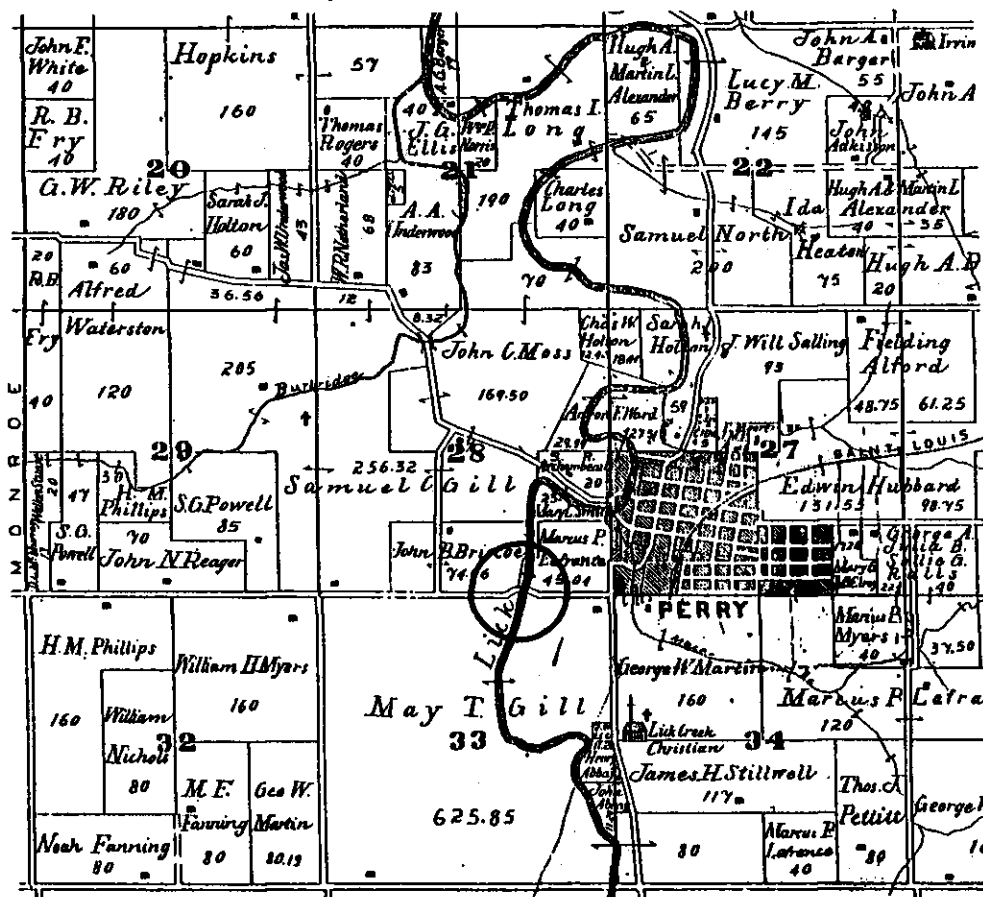


Figure 1. Location map of Gill Bridge, from *Atlas of Ralls County, Missouri*, 1904.

lengths resulted in standardized sizes for the verticals, diagonals and chord members, making fabrication and assembly relatively easy. "The Pratt truss is the type most commonly used in America for spans under two hundred and fifty feet in length," noted bridge engineer J.A.L. Waddell wrote in 1916. "Its advantages are simplicity, economy of metal, and suitability for connecting to the floor and lateral systems."<sup>15</sup>

In the highly competitive bridge manufacturing industry, in which efficiency equated with profit, Pratt trusses received almost universal use. Virtually all of the major regional fabricators manufactured Pratt trusses and marketed them extensively to Missouri's counties in the late 19th and early 20th centuries. As a result, the Pratt truss was the structure of choice in Missouri for medium- and long-span wagon bridges. More Pratt trusses were built in Missouri during the period than all other truss types combined.

The short-span bridge that Stupp fabricated for the Lick Creek crossing in 1909 featured a standard Pratt configuration, straight from Stupp's current roster of designs. With a nominal roadway width of 12 feet and a span length of 95 feet, the truss was divided into five equal panels.<sup>16</sup> The inclined endposts and upper chords consisted of two back-to-back channels, covered by a continuous plate on top and joined by batten plates beneath. The verticals in the interior panels were similarly configured, with two back-to-back channels laced together by metal straps. Two looped square eyebars formed the verticals at the hips. The lower chords and diagonals were each made up of two looped rectangular eye-bars; the counters consisted of round eyerods with slotted turnbuckles. I-beam floor beams were field-bolted to the verticals below the lower chord pins; these carried the steel stringers, which in turn supported the timber deck. The struts were comprised of two angles, with A-frame struts at the portals. Both upper and lower lateral braces were round rods with threaded ends.

The truss was supported on all four corners by built-up steel bearing shoes, with fixed bearings on one end and sliding bearings on the other. The shoes were anchor-bolted to concrete-filled steel cylinder piers founded on driven piles. The channel span was approached on each side by a steel stringer span, with concrete mass abutments and angled wingwalls. Decorative cast iron plates mounted on the bridge's portals identified the builder and listed the members of the county administration.<sup>17</sup>

Soon after receiving the contract for the bridge, a Stupp Brothers crew began work on the substructural excavation. Meanwhile, the truss was fabricated in the firm's St. Louis shops, using members rolled in Pittsburgh by the Cambria Steel Company. Construction progressed quickly through the spring and summer, and by August the bridge was completed and accepted by the county.<sup>18</sup>

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The road served as the main route west from Perry until its subsequent replacement by State Highway 154. Today the Gill Bridge and County Road 181 carry local farm-to-market traffic. The bridge's deck has been replaced more than once, its steel angle guardrails have been mangled by several collisions at the approaches, and the walls of its tubular piers are beginning to bulge after several of the rivets have failed. The truss's steel superstructure remains essentially intact, however, although its deteriorating condition has prompted the county to post the bridge with a four-ton load limit. No longer suitable to carry heavy, wide farm implements, the Gill Bridge is now scheduled for replacement.

Like virtually all of Missouri's counties, Ralls County followed a definite progression in its bridge construction in the 19th century, in response to evolving transportation needs and technological development in the bridge industry. The first simple spans, built as the county was undergoing its initial settlement, were rudimentary timber structures. These were cheap and easy to build but lacking in durability and limited in span length. With greater revenues from increased settlement, the county could undertake more ambitious timber/iron combination trusses in the 1860s and 1870s. These, in turn, were superseded in the late 1870s by all-iron spans, made readily available by mass production. Although the county court barely noticed the transition from iron to steel in the 1890s, this evolution marked a watershed that would continue into the 20th century for bridge fabricators and the rolling mills that supplied them.

The Gill Bridge, with a fabrication date of 1909 and a span length of 95 feet, is neither the oldest nor the longest of the Ralls County's remaining spans. The significance of this span does not lie in its representation of unusual or innovative technology. At the time of its construction, it was one of the thousands of pinned Pratt trusses erected throughout Missouri. Rather, the Gill Bridge is important for its illustration of two prevailing bridge trends—the construction of rural roadway bridges by county governments and the design and manufacture of pinned Pratt trusses in the late 19th and early 20th centuries. The Gill Bridge is today distinguished among Missouri's pin-connected trusses as well-documented and well-preserved example of what was once a mainstay structural type.

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## Endnotes

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<sup>1</sup>Milton D. Rafferty, *Historical Atlas of Missouri* (Norman, Oklahoma: University of Oklahoma Press, 1982), n.p.; Williams, Walter, Jr., *History of Northeast Missouri* (New York: Lewis Publishing Company, 1912), pp. 532-33.

<sup>2</sup>Goldena Roland Howard, *Rolls County, Missouri* (New London, Missouri: By the Author, 1980), pp. 153-57; Ralls County Court Record, Book A, p. 16 (6 February 1855), located at the County Clerk's Office, Ralls County Courthouse, New London, Missouri.

<sup>3</sup>Goldena Roland Howard, *Rolls County, Missouri*, pp. 153-57.

<sup>4</sup>This last route was made toll-free by the county in 1909.

<sup>5</sup>Ralls County Court Record, Book E, p. 395 (4 April 1900); p. 417 (5 June 1900); p. 424 (6 August 1900); p. 449 (1 January 1901); p. 471 (6 March 1901); p. 477 (4 April 1901); p. 484 (3 June 1901); p. 486 (1 July 1901); p. 499 (4 September 1901); p. 581 (5 November 1902); p. 611 (4 May 1903); p. 616 (1 June 1903); p. 622 (3 August 1903). George H. Engle, correspondence to Ralls County Court, various dates, located at County Clerk's Office, Ralls County Courthouse, New London, Missouri.

<sup>6</sup>E.D. Kargau, *Mercontile, Industriel and Professionol Soint Louis* (St. Louis: Nixon-Jones Printing Company, 1898), p. 311. The article on the Stupps concludes: "The three brothers Stupp are natives of this city, experts in their line, in which they grew up from boyhood[,] and are well known for fair dealing and uprightness, rewarded by deserved success."

<sup>7</sup>Tony Fusco, "Stupp Bros. Bridge & Iron Co.," *Corondolet Historical Society Newsletter* 4 (December 1972): 7-8. Stupp Brothers is still in business, still under family ownership, today.

<sup>8</sup>Ralls County Court Record, Book E, p. 625 (7 September 1903); p. 633 (6 October 1903); Book F, p. 22 (7 March 1904).

<sup>9</sup>"Petition," from M.P. LaFrance et al. to Ralls County Court, 8 August 1905, located at County Clerk's Office, Ralls County Courthouse, New London, Missouri.

<sup>10</sup>The May T. Gill House is still standing in well-preserved condition.

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<sup>11</sup>Williams, Walter, Jr., *History of Northeast Missouri*, pp. 1713-14; *Portrait and Biographical Record of Marion, Ralls, Pike Counties, Missouri* (Chicago: C.C. Owen and Company, 1895); Goldena Roland Howard, *Ralls County, Missouri*, p. 377.

<sup>12</sup>Williams, Walter, Jr., *History of Northeast Missouri*, pp. 1713-14.

<sup>13</sup>*Ibid.*, p. 1714.

<sup>14</sup>Ralls County Court Record, Book F, p. 606 (12 April 1909); pp. 623-24 (3 May 1909); Book G, p. 5 (56 July 1909); p. 17 (3 August 1909); p. 28 (8 September 1909).

<sup>15</sup>J.A.L. Waddell, *Bridge Engineering* (London: John Wiley and Sons, 1916), 468.

<sup>16</sup>The description that follows is based upon a field inspection of the bridge by Clayton Fraser on 27 February 1996.

<sup>17</sup>The text of the plate is: "1909 / STUPP BRO'S / BRIDGE & IRON CO. / H.J. PRIEST PRES. JUDGE / J.H. HOLLOWAY M.T. GILL ASSOCIATE JUDGES / A.V. ELY COUNTY SURVEYOR.

<sup>18</sup>Ralls County Court Record, Book G, page 5 (5 July 1909); p. 17 (3 August 1909).

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